

Appln. No. 10/799,166
Amdt. dated: May 20, 2005
Reply to Office Action dated: Dec. 21, 2004

Remarks/Arguments

These remarks are in response to the Office Action dated December 21, 2004. This reply is being filed along with a Request for Extension of Time.

At the time of the Office Action, claims 1-85 were pending in the application. Claims 1-35, 37, 39-81 and 83-85 are still pending in the application.

The Claims have been amended in light of the official action and to more accurately state what the Applicant believes is his invention. In this regard, Claims 1, 27, 30, 34, 35, 37, 50, 51, 55, 63, 68, 72, 73, 75-77 and 83-85 are currently amended and Claims 36, 38 and 82 are cancelled. It is believed that no new subject matter has been added with the amendments.

The Examiner rejected Claims 1-85 on the grounds that they are indefinite and therefore not in accordance with 35 USC 112. Applicant has amended the claims to recite the correct antecedents in accordance with the suggestions of the Examiner and submits that the claims as amended overcome these objections.

The Examiner also objected to Claims 41, 43, 45, 47 and 83 on the ground that they are indefinite by reciting the TIA/EIA 568 B.2 & B2.1 standard and the NFPA 262 standard. Applicant respectfully traverses this objection as follows. These standards define well established standards that are well known to a person of ordinary skill in the art. Indeed, the practice of claiming based on achievement of a particular standard is evidently an accepted practice. For example, Applicant refers the Examiner to Claim 1 of the issued US Patent No. 6,147,309 by Mottine and cited by the Examiner in this Official Action. In this claim, the cable is said to comply with the TIA/EIA 568A standard and configured such that the cable passes the UL-910 plenum burn test and meets the physical requirements set forth in the UL-444 standard. The TIA/EIA 568 B.2 & B2.1 and NFPA 262 standards being well defined and known in the art, just as the TIA/EIA 568A, UL-910 and UL-444 standards accepted in the Claims of Mottine, Applicant respectfully submits that claims 41, 43, 45, 47, 83 of the present application are in fact definite and, unless otherwise objected to, allowable in their present form.

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Appln. No. 10/799,166
Amdt. dated: May 20, 2005
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The Examiner rejected Claims 83 and 84 as being anticipated by Mottine et al. Applicant submits that Claims 83 and 84 as amended overcome this rejection. Mottine teaches a flame retardant Plenum Cable that relies exclusively on a high Flame Retardant and Smoke Retardant PVDF jacket (column 9, lines 10-65). Due to the high dielectric constant and dissipation factor of the PVDF jacket, the resulting cable is limited to Category 5, or at best Category 5e performance levels, as presented in the Claims therein. Namely, the cable disclosed by Mottine et al. would not meet the Category 6 attenuation standards defined by the equation $1.82\sqrt{f} + 0.0169f + 0.025/\sqrt{f}$, which are much more limiting than Category 5 attenuation standards, defined by the equation disclosed by Mottine et al. at column 3, line 65 and in Claim 5 therein. Further, as disclosed in column 14, lines 55-65, the foam insulating materials used therein limit the cables constructed therewith to Category 5 performance since twist lays short enough to comply with Category 6 standards may not be achieved using these foams, the foams exhibiting a crush resistance insufficient to bear such tight twist lays. As a result, applicant submits that Mottine does not anticipate or render obvious the invention claimed in amended claims 83 and 84.

The Examiner rejected Claim 83 as being anticipated by Ebrahimian et al. Applicant submits that Claim 83 as amended overcomes this rejection. Ebrahimian teaches a communication cable comprising four twisted pairs of insulated wires, at least one inner layer, an outer layer and an outer jacket, which combined, is disclosed to meet NFPA 262 standards. Yet, nowhere in the text of the specification does Ebrahimian suggest that his cables can meet both NFPA 262 and Category 6 requirements. In fact, Applicant respectfully submits that the cables disclosed by Ebrahimian could not meet Category 6 attenuation requirements. For instance, each of the cables tested by Ebrahimian list dielectric constants (Table 2 therein) above 2.5, a dielectric constant below 2.5 being a necessary condition to meet Category 6 attenuation requirements. Furthermore, the cable construction reported in test #5 of Table 3, though providing a flame travel of less than 5.0 feet, a peak smoke development of less than 0.50 and an average smoke development of less than 0.15, comprises a foam inner layer that would not be suitable for Category 6 cabling.

{00006247;}

Appln. No. 10/799,166
Amdt. dated: May 20, 2005
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Namely, the inner foam layer would not be suitable for the short twist lays required for Category 6 NEXT in view of the low crush resistance of the foam. Both Mottine and Adriaenssens make mention of this in the body of their patents. In particular, Mottine teaches that foam-skin insulated conductors are limited to Category 5 NEXT requirements (column 14, line 66 to column 15, line 5) due to the foam's limited crush resistance. Consequently, applicant respectfully submits that Claim 83 is not anticipated by Ebrahimiian as the cables disclosed therein could not meet Category 6 requirements, requirements claimed as being met by the cable of Claim 83.

The Examiner rejected Claims 83 and 85 as being unpatentable over Glew in view of Ebrahimiian. Glew discloses a communication cable comprising four twisted pairs of insulated wires, each insulated wire comprising a conductor, at least one inner layer, an outer layer and an outer jacket. Glew does not disclose a Category 6 cable that meets the flame travel, peak smoke development and average smoke development requirements listed in Claim 83. Ebrahimiian does disclose a communication cable that meets the above flame travel and smoke development requirements but fails to disclose a cable construction that also meets Category 6 requirements. As a result, Applicant submits that there would be no impetus to for a person of skill in the art to combine the teachings of Glew and Ebrahimiian if he was seeking to develop a Category 6 cable having the claimed flame travel, peak smoke development and average smoke development requirements. However, Applicant also submits that even if a person of skill in the art was to combine the teachings of Glew and Ebrahimiian, a cable as claimed in Claim 83 would still not be arrived at. Therefore Applicant respectfully submits that Claim 83 is patentable over Glew in view of Ebrahimiian. Applicant also submits that Claim 85 as depending from an allowable claim is also an allowable claim.

In view of the above arguments addressing objections to the patentability of Claims 83-85, Applicant respectfully submits that Claims 83-85 as amended are all allowable claims.

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Appln. No. 10/799,166
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The Examiner has rejected Claim 1 as being obvious over Vexler in view of Ebrahimian. Applicant submits that Claim 1 as amended overcomes this objection. In particular, Claim 1 has been amended to claim an insulated wire for use in a communication cable, the wire comprising a conductor, at least one inner insulating layer surrounding the conductor, at least one of the at least one inner insulating layer being a nano-composite comprising nano-sized platelets and a flame and smoke retardant additive package dispersed within a polyolefin matrix and, an outer layer surrounding the inner insulating layer, wherein the outer layer is substantially resistant to flame spread and smoke evolution, substantially impermeable to moisture and moisture absorption and has a dielectric constant lower than about 2.5 and a dissipation coefficient lower than about 0.001 at frequencies up to about 650 MHz and, *wherein the at least one inner layer has a volume of at least about 35% and up to about 70% of the volume of the at least one inner layer and the outer layer combined.*

Vexler discloses an insulated wire for use in a communications cable, the wire comprising a conductor, at least one inner insulating layer and an outer layer. In particular, the outer layer of Vexler is eccentric, and the twisted pairs of conductors are arranged such that the thickness of the outer layer (or inner layer, depending on the embodiment) is thinner in a region of contact between the insulated conductors of the same pair than in a region of contact between the insulated conductors of adjacent pairs. It is due to this construction that the design of Vexler achieves improvements in near and far end crosstalk. Ebrahimian for its part discloses a composition comprising nano-sized platelets and a flame and smoke retardant additive package dispersed within a polyolefin matrix.

Applicant respectfully submits that, notwithstanding the teachings of Vexler and Ebrahimian, Claim 1 as amended would not have been obvious to a person of skill in the art. Indeed, nowhere in either Vexler and Ebrahimian taken alone or in combination is there the mention of a wire comprising an inner layer being a nano-composite comprising nano-sized platelets and an outer layer such that the volume of the inner layer is at least about 35% and up to about 70% of the volume of the combined layers. In particular, Vexler teaches that in order to obtain the advantages listed hereinabove,

(00006247;)

Appln. No. 10/799,166
Amdt. dated: May 20, 2005
Reply to Office Action dated: Dec. 21, 2004

the outer elastomer layer thickness is preferably at least 15% of the overall insulation thickness of the wire. Consequently, Vexler teaches a wire comprising an inner layer of thickness preferably selected to be between 0% to approximately 85% of the overall insulation thickness. This range firstly discusses layer thickness ratios instead of layer volume ratios. Secondly, the range taught by Vexler, when approximately converted to volume ratios, greatly exceeds the range claimed in amended Claim 1.

In light of the above, Applicant respectfully submits that Vexler teaches away from the construction of the wire claimed in amended Claim 1 and that one of skill in the art would not be inclined to narrow the range taught by Vexler in view of using the teachings of Ebrahimian to construct the claimed wire. In fact, Ebrahimian provides no suggestion as to what kind of layer volume ratio would be effective for his nano-composite composition to be used as an inner layer when combined with an outer layer having a dielectric constant lower than 2.5 and a dissipation coefficient lower than 0.001 at frequencies up to about 650MHz. Consequently, in view of the above arguments, Applicant respectfully submits that amended Claim 1 is an allowable claim.

Examiner has rejected Claims 2-5, 9-11, 26-30 as being obvious over Vexler in view of Ebrahimian and Claims 31-35 as being obvious over Vexler in view of Ebrahimian and Spruell. Applicant respectfully submits that since Claims 2-5, 9-11, 26-30 and 31-35 depend on the allowable Claim 1, these Claims are also allowable.

The Examiner has rejected Claim 37 as being unpatentable over Glew in view of Adriaenssens. Claim 37 has been amended to better reflect what the Applicant believes to be his invention. In particular, Claim 37 has been amended to claim a communications cable comprising a plurality of insulated wires, each of the wires comprising a conductor, at least one fire and smoke retardant inner insulating layer encasing the conductor and, an outer layer encasing the insulating layer, wherein the outer layer is substantially resistant to flame spread and smoke evolution, substantially impermeable to moisture and wherein the outer layer has a dielectric constant lower than about 2.5 and dissipation coefficient lower than about 0.001 at frequencies up to about 650 MHz and, an outer jacket encasing the plurality of wires, wherein the at least one inner layer has a volume of at least about 35% and up to about 70% of the volume

{00006247:}

Appln. No. 10/799,166
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Reply to Office Action dated: Dec. 21, 2004

of the at least one inner layer and the outer layer combined and wherein at least one of the at least one inner insulating layer is a nano-composite layer comprising nano-sized platelets and a flame and smoke retardant additive package dispersed within a polyolefin matrix.

Glew discloses a communication cable comprising a plurality of insulated wires, each or the wires comprising a conductor, an insulating inner layer, an outer layer and an outer jacket. Adriaenssens discloses a communications cable comprising a dual insulation system that is flame-retardant and which is characterized by a suitably low dissipation. Neither Glew nor Adriaenssens discloses a communications cable comprising a plurality of insulated wires, each of said wires comprising at least one fire and smoke retardant inner insulating layer, an outer layer being substantially resistant to flame spread and smoke evolution, substantially impermeable to moisture and having a dielectric constant lower than about 2.5 and dissipation coefficient lower than about 0.001 at frequencies up to about 650 MHz; wherein said at least one inner layer has a volume of at least about 35% and up to about 70% of the volume of said at least one inner layer and said outer layer combined and wherein at least one of said at least one inner insulating layer is a nano-composite layer comprising nano-sized platelets and a flame and smoke retardant additive package dispersed within a polyolefin matrix. In addition, such a wire would not have been obvious to one of skill in the art upon reference to Glew and Adriaenssens, or upon reference to any other, or combination of, prior art cited in this Official Action. As argued hereinabove with regards to Claim 1, the layer volume ratio range defined in the once amended Claim 37 distinguishes this claim from any known prior art and teaches the construction of a cable exhibiting the above unexpected performance results. Applicant thus respectfully submits that Claim 37, as amended herein, is an allowable claims.

Examiner has rejected Claims 39-49 as being obvious over Glew in view of Adriaenssens, Claims 78-81 as being obvious over Glew in view of Adriaenssens and Spruell, and Claims 38, 50, 51, 55, 57, 72-76 and 82 as being obvious over Glew in view of Adriaenssens and Ebrahimian. Applicant respectfully submits that since Claims

{00006247;}

Appln. No. 10/799,166
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38-51, 55, 57, 72-76 and 78-82 depend on the allowable Claim 37, these Claims are also allowable.

Applicant believes to have addressed all of the objections and rejections provided by the Examiner in this Official Action and respectfully submits that the currently pending claims of the application, namely Claims 1-35, 37, 39-81 and 83-85, are all in allowable form. Applicant respectfully request a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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Date



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